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<p>COMPUTER OPERATOR SYSTEM</p> <p>FUNCTIONAL DESIGN</p>
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USAID Project Number: 263-0170
[Develop a Detailed and Updated Management Information System for the
Egyptian Health Insurance Organization, Cost Recovery Program]

Prepared by:
The MAXIMUS, Chemonics, Arabsoft Project Team

Date:
August 10, 1995

July 3, 1995

Mr. Carl Abdou Rahmaan
Acting Project Officer
USAID - Egypt
106 Kasr El Aini Street, 7th Floor
Cairo, Egypt

Ref: Project Number 263-0170

Dear Mr. Abdou Rahmaan:

MAXIMUS is pleased to submit this draft functional design document for the Admission, Discharge, and Transfer Module. This functional design was developed based on numerous site visits to HIO Headquarters, branch offices, and hospitals, and through consultation with key personnel related to those sites.

This document outlines a system to track the admission status of patients at HIO hospitals. The system also provides powerful tools for analysis and reporting. We ask that you review this document 1) to verify that the design reflects what was discussed during site visits and walk-throughs; 2) to validate that, when seen as a whole, the automated process will enhance the effectiveness of each operational area; 3) to confirm that assumptions are valid; and 4) to identify any organizational, policy and procedural changes which may be necessary for the success of the project.

We welcome a discussion of any questions or concerns you may have regarding this document. Work on the module's detailed design is now underway. To avoid expending additional level of effort reworking the design, we request you provide any comments within four weeks of our submission of this document. If you have any questions, please do not hesitate to contact me.

Sincerely,

Leslie Graham
Chief of Party

July 3, 1995

Dr. Nabil El Mehairy
Chairman
Health Insurance Organization
Heliopolis
Cairo, Egypt

Dear Dr. El Mehairy:

MAXIMUS is pleased to submit this draft functional design document for the Admission, Discharge, and Transfer Module. This functional design was developed based on numerous site visits to HIO Headquarters, branch offices, and hospitals, and through consultation with key personnel related to those sites.

This document outlines a system to track the admission status of patients at HIO hospitals. The system also provides powerful tools for analysis and reporting. We ask that the HIO review this document 1) to verify that the design reflects what was discussed during site visits and walk-throughs, and 2) to validate that, when seen as a whole, the automated process will enhance the effectiveness of each operational area. Please pay close attention to Section 3, General Assumptions. The module's success depends on these assumptions being true, or the HIO's ability to accomplish them. Also please read the document to identify any organizational, policy and procedural changes which may be necessary for the success of the project.

We look forward to your comments and suggestions. If you have any questions about this functional design document, please do not hesitate to contact me.

Sincerely,

Leslie Graham
Chief of Party

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cc:	General Faisal Taie, HIO Mr. Carl Abdou Rahmaan	

1 INTRODUCTION

This document presents the functional design for the Admission, Discharge, and Transfer Module. The Admission, Discharge, and Transfer (A/D/T) Module is a second phase module of the automated Management Information System (MIS) being developed for the Egyptian Health Insurance Organization (HIO). Second phase modules like A/D/T are designed for use in HIO hospitals. This HIO MIS is being developed in conjunction with the HIO and the U.S. Agency for International Development (USAID).

1.1 Purpose of the Document

This functional design document is intended to serve essentially the same function as a blueprint for a building; to provide a design for the technicians to follow in creating the project, and to provide a document for review and change before the design is put into place.

At a high level, this document describes the following:

- o who, organizationally, are the users who will directly interact with the system;
- o what functions the system will provide to those users;
- o what organizational, policy and procedural changes must be implemented along with the system for it to be effective; and
- o any assumptions upon which the design is based.

This document intends to serve as a baseline for review and comment. It documents discussions held to date and information gathered during site visits. It lays out a design that, given the information known, appears useful and realistic. At many stages in the design, there were alternative approaches available. However, through discussions with heads of hospital Statistical and Registration, and Medical Records Departments, it became apparent that many of the alternatives were unrealistic. Only those alternatives deemed operationally feasible are considered here. This functional design document incorporates the results of those site visits and interviews. These results and data served as input for creating this document that discusses "what" functions are to be considered. "How" these functions are to be accomplished will be described in the module's detailed design document.

1.2 Process Used to Develop Design

Before beginning the design, it was important that the A/D/T Development Team understand current operations, and the range of procedures that are followed throughout HIO

hospitals. To understand these, the A/D/T Team conducted numerous visits to HIO hospitals across the branches. Visits were made to hospital Statistical and Registration, and Medical Records Departments.

A summary of site visits conducted can be found in Appendix D.

In addition to viewing operations at individual sites, discussions and design walkthroughs were held on an ongoing basis with the heads of Admission Offices and Medical Records Departments.

Before beginning the design, it was important that we have a clear picture of current operations and the range of procedures that are followed throughout HIO. By talking with the people who currently perform or manage the performance of A/D/T processes, we created a picture of the existing system. An overview of the existing process is given in Section 2 of this document.

To validate our view of existing processes, we conducted walkthroughs of the functional decomposition. Feedback was received from the HIO and revisions made. Once our understanding of the existing process had solidified, we began to develop a design for an automated system. The intent of this design is to:

- o replace certain manual processes that can be more efficiently handled by the computer;
- o support existing manual processes that are still necessary, but can be aided by the computer; and
- o reengineer some operational areas that can be structured more effectively in an automated environment.

At many points in the development of this design, there were questions about what was feasible, in terms of organization, policy and procedural changes, and also what the HIO would prefer. The Admission Department heads were essential in this process. Iteratively, we worked with these groups to define and refine the design so that it fits within the existing process, or required changes that were deemed possible by those who manage the affected areas.

The process of design requires compromise. Ideal operations from an automated viewpoint may not always be feasible given organizational constraints. This design seeks to offer a solution that is beneficial to the HIO. At the same time it is realistic, and is flexible enough to respond to possible changes in current operations.

1.3 Intended Audience

This document represents a high-level, but technical, specification of the discussions held

thus far with the HIO. There should be nothing in this document that is a surprise to those who participated in the design process. It is merely a structured method of recording the design discussed and documenting the alternatives selected.

It is expected that the audience for this document is the managers of the organizational areas that will be affected by the design as well as HIO senior management. This document should be reviewed for the following:

- o to verify that it represents what was discussed during the walkthroughs;
- o to validate that, when seen as a whole, the automated process described will enhance the functioning of each operational area;
- o to agree that the assumptions used are valid; and
- o to commit to the organizational, policy, and procedural changes outlined as necessary for success.

In addition, senior managers should review this document to ensure that the information collected by the system will assist in making accurate management decisions.

2 GENERAL OVERVIEW OF THE SYSTEM

The development of a Management Information System for use by the Health Insurance Organization is a large undertaking, of which A/D/T is one piece. Exhibit 2-1 is a logframe summary of project activities. Exhibit 2-2 is a logframe summary of the A/D/T Module.

This section provides a high-level overview of the modules to be included in the HIO MIS, and the interaction between those modules. This section also includes a description of the existing operational processes associated with A/D/T. After a review of the current practices, the proposed process is described. This section presents a high-level view only. A technical functional design description is provided in Section 4.

2.1 Overview of the HIO MIS

The HIO MIS is being developed in phases. Software applicable to hospitals is being developed in the second phase.

The modules in the second phase are:

- o Admission Discharge and Transfer,
- o Inpatient Patient Records,
- o Drug Control (Inpatient), and
- o Cost Accounting (Inpatient).

None of these modules stands alone. Each contributes information to the database and uses information provided by other modules. The purpose of all modules, in addition to supporting operational areas, is to collect and provide management with detailed information about the HIO. With this improved level of information, HIO management can make well-informed and timely decisions regarding cost containment and service provision; a decision-making capacity that is essential as the organization continues to grow and evolve.

All applications for a hospital reside on the machine at that facility. Therefore, within a facility all applications have access to the database on that facility's machine. For example, visit information already entered through A/D/T does not need to be reentered for the Drug Control Application. In addition, data can be shared between facilities.

This data sharing is transparent to the user. The applications are designed to share data, and the user does not need to do anything to have this happen. On the other hand, all data being shared between applications does not mean that the database is open to all. Operational areas

that have no need to view certain data are not given the opportunity to do so.

Exhibit 2-1 (page 1 of 2)
DRAFT LOGICAL FRAMEWORK
OVERALL PROJECT

PROJECT NARRATIVE	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Project Goal Improve HIO ability to raise treatment quality and contain costs .	End of Project Status Lower costs for drugs per patient. Shorter lengths of stay in hospitals. Reduced number of patient visits per episode of illness. Lower cost of treatment per patient. Higher proportion of favorable outcomes per patient.	Statistical data from HIO. Statistical data from MIS.	HIO supports a MIS. HIO involved in MIS design. HIO provides resources. HIO adopts policies and procedures to maximize use of system.
Project Purpose Build and implement a MIS throughout the HIO.	Measures of Achievement Number of HIO sites automated and using MIS. Number of S/W application modules running.	Site visits. End of Project Status Evaluation.	HIO managers involved in system implementation.
Outputs MIS systems in use in facilities. System generated reports. Trained HIO staff.	Magnitude of Outputs 160+ systems installed in Egypt. Electronic and hardcopy reports for every HIO function. 2000+ staff trained.	Site visits. Project reports. End of Project Status Evaluation.	Staff available for training. Enough qualified staff found for each job. HIO purchases needed equipment. HIO obtain telecom. lines.

Exhibit 2-1 (page 2 of 2)
DRAFT LOGICAL FRAMEWORK
OVERALL PROJECT

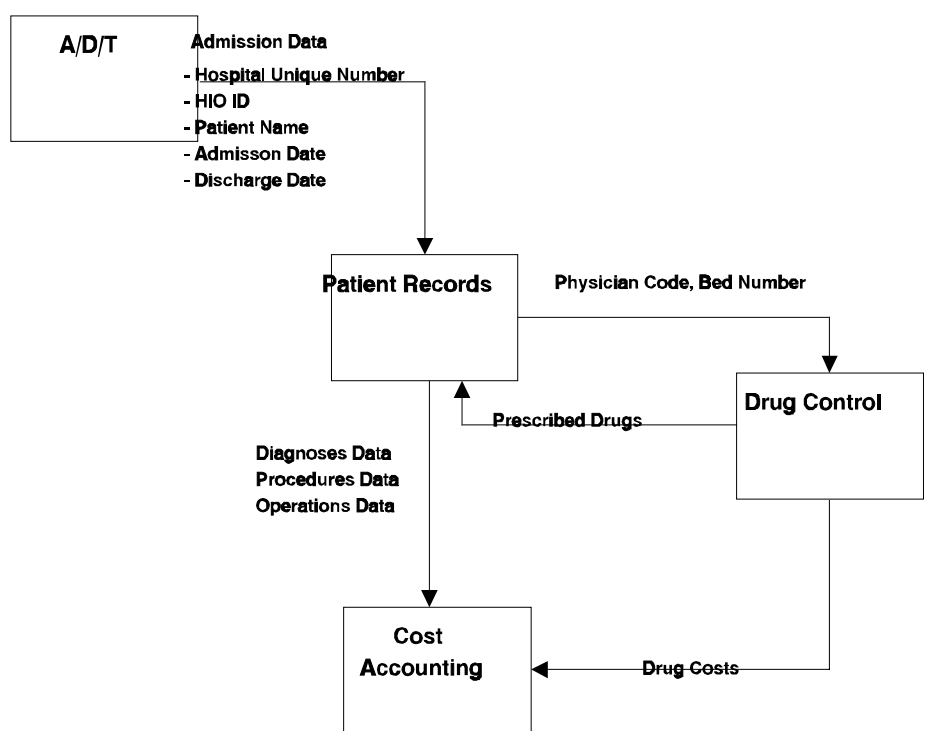
PROJECT NARRATIVE	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Inputs USAID Funding - Training - Technical Assistance - Commodities HIO Project Resources - Vehicles - Office Space - Furniture - Electronic Power - Telecom Lines HIO Regular Resources - Facilities - Clinical - Administrative	Magnitude of Inputs \$21M+ 8 Project vehicles Al Ahram Building Furnish each clinic computer room. 250 KV Transformer. 8 computer centers. Medical Practice Committee. Drug Formulary Committee. Management Analysis Office. Computer supplies budget. Telecom. cost budget. Hardware maintenance budget.	Financial records. Status reports. End of Project Evaluation. Site visits.	MIS remains a priority of the HIO. Resource support from HIO continues.

Exhibit 2-2
DRAFT LOGICAL FRAMEWORK
A/D/T MODULE

PROJECT NARRATIVE	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Module Goal Improve HIO ability to manage admissions, discharges, and transfers, thereby improving the quality of service given.	End of Project Status Check beneficiary eligibility. Better service per patient. Provide more accurate information for the different HIO level. Generate reports & statistics.	Admission, Discharge, and Transfer Module	HIO uses module data. HIO adopts policies & procedures to maximize use of system.
Module Purpose Automate the admission, discharge, and transfers processes.	Measures of Achievement Number of HIO sites using Admission, Discharge, and Transfer Module.	Site visits. End of Project Status Evaluation.	HIO managers involved in system implementation.
Outputs Admission, Discharge, and Transfer Module in use in facilities. System generated reports. Trained HIO staff.	Magnitude of Outputs 20+ systems installed in Egypt. Electronic & hardcopy reports for admission, discharge and transfer functions.	Site visits. Project reports. End of Project Status Evaluation.	Staff available for training. Enough qualified staff found for each job.
Inputs HIO decision-making resources.	Magnitude of Inputs High-level hospital management staff.	Status Reports. End of Project Status Evaluation. Site Visits.	Resource support from HIO continues.

Exhibit 2-3 depicts data being shared between applications.

Exhibit 2-3
INTERFACES WITH OTHER SYSTEMS



2.2 The Admission, Discharge, and Transfer Process

A/D/T is the backbone for all the modules that will be developed for HIO hospitals. The A/D/T Module is intended to:

- o record eligibility and other basic data on beneficiaries,
- o validate the eligibility of persons requesting health care at HIO-owned hospitals, and
- o trace the admission status of the hospital patients.

A/D/T will include all relevant data for employees (Law 32 and Law 79), and for pensioners and widows. Non-HIO patients will also be handled by this system.

2.3 Review of The Current Admission, Discharge, and Transfer Process

The A/D/T Team conducted site visits to HIO hospitals in Cairo Branch and Northwest Delta Branch (NWDB). The purpose of the visits was to study the admission, discharge and transfer procedures that are currently in use. The study revealed that the system used in the Cairo Branch is similar to the system used in the NWDB.

This analysis was performed in order to avoid duplicating existing problems in the new system.

Some of the problems posed by the existing manual system are:

- o delays in the admission of patients at some hospitals;
- o no capability for eligibility checking; and
- o no system to track patients, particularly if the patient was transferred from one section to another.

The purpose of the site visits was to study the eligibility validation procedure, admission procedure, as well as the procedure for maintaining patient records. A full list of the sites visited and the HIO staff interviewed can be found in Appendix D.

At the Admissions Office the cycle starts with completion of some sections of the Admission/Discharge Form (Exhibits 2-4 and 2-5), which is a summary record of a patient's visit data. At admission, a physician completes admission data on the form. The discharge section of the form is completed later, when the patient leaves the hospital. The Admission/Discharge Form in Exhibit 2-4 is not standard at HIO hospitals, although the majority of hospitals reviewed use a form that is very similar.

2.3.1 Reception

Admission to an HIO hospital begins at the reception, where a physician evaluates incoming patients. At the reception, a decision is made whether a patient should be treated and released, or admitted to the hospital. If the physician's decision is to treat the patient on the spot, the only record is in the reception physician log. The physician approves a patient's admission in any of the following cases:

- o A patient is being transferred from an HIO clinic. In this case, the reception physician will check the transfer letter. If the letter is valid, the patient is sent to the Admission/Discharge Office.
- o Any emergency case is immediately admitted to the hospital.
- . If an emergency patient is an HIO beneficiary, the patient's HIO number is recorded and he is admitted as a regular HIO patient.

Exhibit 2-4
ADMISSION/DISCHARGE FORM

Health Insurance Organization
Northwest Delta Branch
Gamal Abdel Nasser Hospital

Admission/Discharge Form

Full Name of the Patient	Age	Male	Egyptian	Single	Hospital Code		
Physician Name		Female	Foreigner	Married	Number		
				Divorced			
				Widower			
Health Insurance Number	Health Insurance Type			Patient's Assigned Clinic			
				Patient's Assigned Hospital			
Place of Work		Occupation		Employee Number			
Work Address				Police Station			
Home Address				Police Station			
Patient Relative's Name					Police Case		
Patient Relative's Address					Yes ()		
					No (Work Injury) ()		
Admission Date	Discharge Date		Period		Case		
Time	Time				Accidents ()		
					Clinic ()		
					Hospital ()		
Department	Room No.	Bed No.	Previous Admission		Department Head		
First Diagnosis							
Admission Officer	Nurse	Department Deputy		Admission Permission			
				Hospital Manager			
Final Diagnosis				Code			
Operations							
Discharge Case				Discharge Permission			
Recovered				Department Specialist			
Getting Better				Department Head			
Hasn't Changed				Hospital Manager			
Died before 48 hours							
Died after 48 hours							

Exhibit 2-5
ADMISSION/DISCHARGE FORM (Arabic)

- o If an emergency patient is not an HIO beneficiary, the patient must provide a down payment and a letter of guarantee that he is able to pay the hospital bill. If the patient is unable to guarantee payment, he is admitted to the HIO hospital until he is stable enough for transfer to another, non-HIO hospital. If the patient is able to guarantee payment, he is treated in the HIO hospital as a non-HIO case.
- o Work injuries are treated similarly to emergency cases.

When any of the above conditions are met, the reception physician refers the patient to the Admission/Discharge Office. In any case where a non-HIO patient is admitted, the patient must pay for care as in a private hospital.

2.3.2 Admission Procedures at the Admission/Discharge Office

All cases that have been approved by the reception physician are transferred to the Admission/Discharge Office which completes all the clerical data for the patient.

2.3.3 The Hospital Section

The nurse on duty completes the patient file and records the needed information in the section admission registers.

At this point in the process, record keeping will taken over by the Patient Records Module.

2.3.4 Transfer from One Section to Another

If a patient is transferred from one section to another, a nurse from the transferring section performs all exit procedures, then escorts the patient, with the patient's file, to the other section. A nurse in the receiving section performs the admission procedures for the transferred patient.

2.3.5 Section Discharge

A patient is discharged from a section for one of the following reasons:

- o the patient is cured,
- o the patient has recovered sufficiently,
- o the patient applied for discharge on his/her own responsibility,

- o the patient went out on his/her own without notifying the doctor, or
- o the death of the patient.

In any of these cases the section doctor completes the Discharge Report and the Admission/Discharge Form. The patient's file is then sent to the Admission/Discharge Office.

2.3.6 Discharge Procedures at the Admission/Discharge Office

The Admission/Discharge Office completes all necessary forms for discharge, including the discharge notes or death certificate and the Daily Discharge Form.

2.3.7 The Statistical Department

The Statistical Department receives records (in forms) from all sections in the hospital, and compiles those records to produce statistical reports. Presently, hospital Statistical Departments produce reports for daily statistics and monthly statistics.

2.4 The Proposed Admission, Discharge, and Transfer Process

When looking at possible design approaches for the Admission, Discharge, and Transfer Module, the primary considerations were:

- o which information to provide to management, and
- o how to ensure the accuracy of the information.

The first question implies a need to define which operational areas will be automated. The second recognizes that we must create, for the people at the operational level, a high stake in the data being accurate.

The design approach presented in this document focuses on providing benefits at the operational level. Benefits will be provided not only to system users, but also to the beneficiaries in terms of an increase in quality of care. An additional benefit will be the flow of information to management. With this information, management will be able to ensure:

- o that policy promotes low cost and high quality care,
- o that procedures accurately reflect policy, and
- o that the policy, as practiced, brings about the desired results.

The A/D/T Module will contribute to this by:

- o checking beneficiary eligibility within the admission process;
- o expediting service at the Admission/Discharge Office;
- o allowing accurate tracking of a patient in the hospital, and easy retrieval of a patient's previous records; and
- o streamlining the process whereby patients are transferred from one section to another and improving the accuracy of transfer records.

To achieve the benefits of this system, some changes in existing procedures will be necessary. These changes will not be great, however, and will significantly improve the quality of the work done.

Sections 2.4.2 through 2.4.6 discuss the types of data to be used as input to the A/D/T Module. For each data type, the functions the system will provide are defined. This section presents a high-level overview. See Section 4 of this document for the technical design descriptions.

2.4.1 Intended Users

The hands-on users of the A/D/T will be the Admission/Discharge Clerks. Section nursing units, while not actually using the computers, will play a key role, as they must complete transfer forms for moving a patient from one section to another.

2.4.2 Data Preparation

This system will need HIO beneficiary data and the hospital assignment of all HIO beneficiaries. The source of this data will be the Branch Statistical Department (this data will be prepared from the SIO and PIO data).

Three steps are needed to prepare data for the A/D/T:

- o A hospital must be assigned to each employer. Employees will be assigned to a hospital based on the employer assignment.
- o A hospital must be assigned to pensioners and widows based on their home address.
- o All lookup tables must be transferred to the hospital database.

Beneficiary data tables will reside at the branch. Beneficiary data will be transferred, as necessary, through the HIO telecommunications system.

2.4.3 Admission Function

As part of the hospital admission procedure, a patient's HIO eligibility will be checked and admission data will be input into the computer. Transfer cases (approximately 85% of hospital admissions) must have a transfer letter from the clinic as well as an HIO ID. Emergency and work injury cases need only the HIO ID.

It is important to note that, unlike the Clinic Beneficiary Registration Application, the A/D/T beneficiary eligibility check function will not stand alone in the computer with its own screen. Every patient's eligibility will be checked as part of the hospital admission process, but the actual beneficiary check function is integrated into the automated hospital admission form.

When a patient arrives at the Admissions/Discharge Office, he will present his transfer letter and HIO ID. The admissions clerk will input data into the automated hospital admissions form on the computer. To conduct an eligibility check, the hospital computer will refer to the beneficiary database residing at the branch (since there will be no beneficiary database at the hospital). This communications will take place through the HIO telecommunications system. If the beneficiary database at the branch verifies the beneficiary's eligibility and the transfer letter is valid, the patient will be admitted to the hospital. At this point, the patient will also be assigned a bed through the A/D/T Bed Plan Function.

The data collected through the admission process will be the foundation of the patient's records in the Inpatient Patient Records Application.

2.4.4 Transfer Function

This function will record and track the transferral of patients from one hospital section to another. To avoid the risk of data loss, the A/D/T Transfer Function is a one-step process.

2.4.5 Discharge Function

The A/D/T will record the discharge of patients from the hospital, as well as the reason for discharge. It will also produce the necessary discharge forms.

2.4.6 Reporting Function

This functions produces statistical reports for use by HIO management both at the hospital and at the branch.

3 GENERAL ASSUMPTIONS

The design presented in this document assumes that certain hardware configurations, policy and procedural changes, and organizational restructuring are possible. The remainder of this section details these assumptions.

3.1 Hardware Layout Assumptions

Exhibit 3-1 shows the hardware layout for hospitals that is necessary to support the design presented. This layout is general and is not intended to define exact quantities or specifications for computers or peripherals.

As shown in the exhibit, hospitals have a full computer system on site. This increases reliability and response time.

Terminals and a printer will be installed at the Admission/Discharge Office for the normal daily admission and discharge work. Terminals in the computer room that will serve the Patient Records Application can also be used to record patient transfers. A possible alternative is to have patient transfers input at the terminals in the Admission/Discharge Office.

3.2 Work Flow Assumptions

This design assumes that the beneficiary database will reside at the branch (the master branch beneficiary database). As needed, the A/D/T will access the branch database through the HIO telecommunications system.

The A/D/T will create each patient's Hospital Unique Number (HUN). The HUN will be used by all other hospital applications. The A/D/T will also create hospital admission records, which will be the foundation for the Inpatient Patient Medical Records Application.

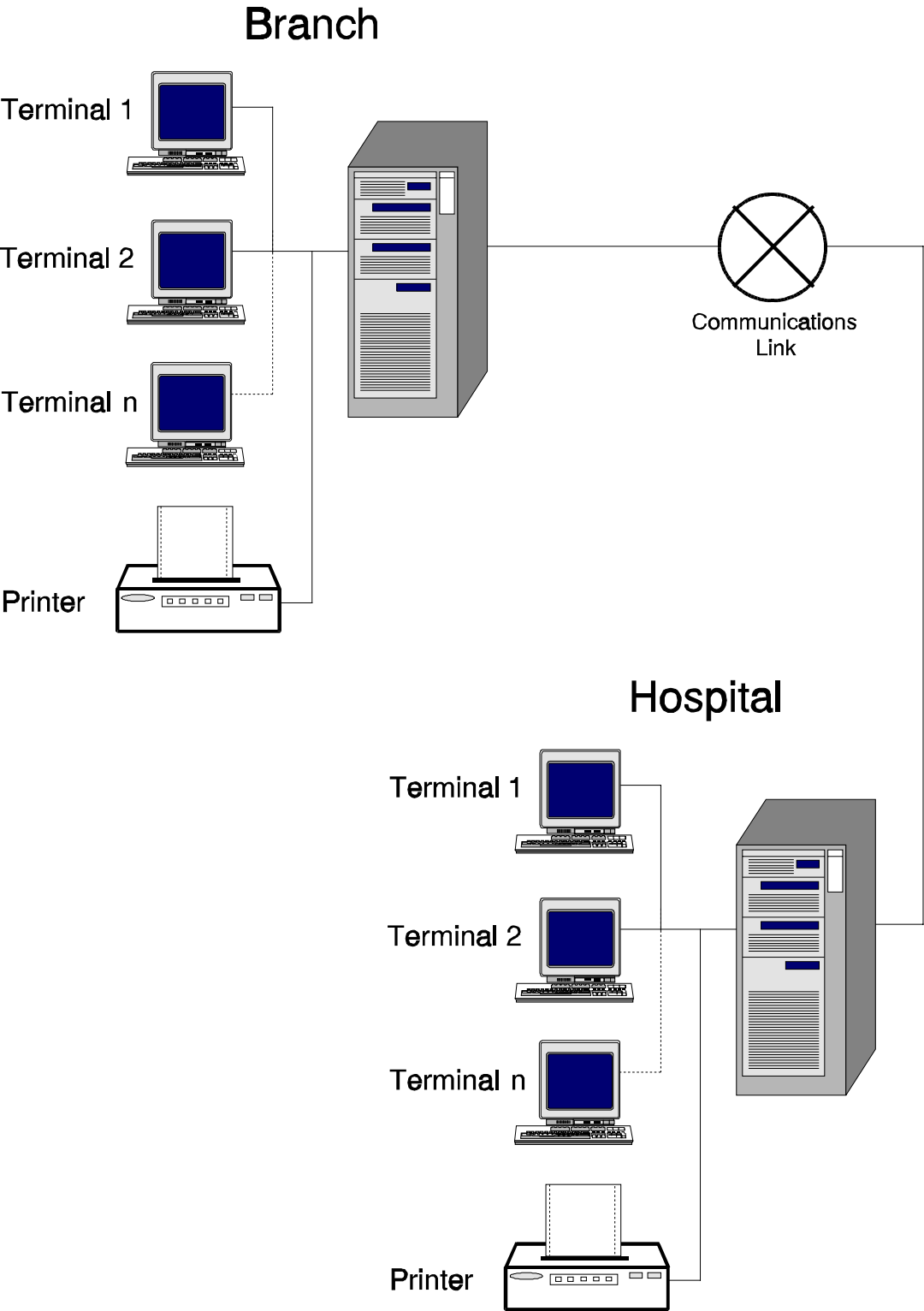
3.3 Process and Procedural Assumptions

In some cases, current practice or procedures do not reflect current policy. One of the key decisions that must be made is whether the system will be used to enforce policy as it currently stands or whether the system will automate existing practice.

Current HIO policy is that a patient needs to present a clinic transfer letter at the Admission/Discharge Office to be admitted to the hospital (if not an emergency or work injury case, or unless the patient is willing to pay for service). This policy is followed by all HIO hospitals. This will remain, unchanged, a part of the automated system.

Exhibit 3-1
PROPOSED HARDWARE LAYOUT

Forms used for record keeping are currently different from one hospital to another. Standard forms need to be developed and used by all HIO hospitals for the A/D/T to



achieve its purpose. HIO approval for those standard forms will be needed.

3.4 Human Resources Assumptions

The responsibilities and functions of some jobs will be affected by the introduction of this computer system. To ensure the effectiveness of the A/D/T Application, proper training for its different users is essential.

- o Admission/Discharge Office clerks need to be trained on admitting and discharging patients using the automated system, and on printing the Admission Form. They will also need to understand the automated eligibility check built into the system.
- o Hospital Statistical Department clerks need to be trained on producing the statistical reports.
- o Nursing staff members need to be trained on procedures for completing a patient transfer form and delivering it to the office where it will be input, whether the Admission/Discharge Office or the computer room. Either data entry staff members or Admission/Discharge Office clerks need to be trained on entering patient transfers.

4 FUNCTIONAL DESIGN

This section describes the functions included in the Admission, Discharge, and Transfer Module. There are seven main functions in the A/D/T. They are described here and illustrated in Functional Decomposition One (FD-1) on page 1 of Appendix D.

- 1. **The Lookup Tables Inquiry Function** will allow a user to view the lookup tables. These data tables are indices of codes and corresponding entities. All A/D/T lookup tables will reside at the hospital database, except the beneficiary table, which will reside at the branch. Most tables will be initialized, maintained, and distributed by HIO Headquarters, to ensure uniformity of tables at all HIO sites.
- 2. **The Bed Master Function** will record the status of every bed in the hospital (empty, occupied, etc.). The data for this function must be entered only when the A/D/T is first implemented or when a room is reassigned to a different hospital section. After that, the system will maintain itself, updating its table automatically.
- 3. **The Admission Function** will, by referencing the branch database (where the beneficiary table will reside), determine if a patient is eligible to receive HIO services. It will also record admission information.
- 4. **The Discharge Function** will record patient discharge information. The information recorded will include the date and reason for the discharge.
- 5. **The Transfer Function** will record patient transfers between hospital sections.
- 6. **The Reporting Function** will produce statistical reports for hospital management and for the Statistical Department.
- 7. **The Operation Theater Scheduling Function** will maintain a schedule for use of operating rooms.

All these functions will be used by hospital clerks.

4.1 Lookup Tables Inquiry Function

The Lookup Tables Inquiry Function allows viewing of any hospital lookup tables. Some tables will be created from existing SIO and PIO tables. Others, specific to the HIO database, will be input manually. Codes will be based on CAPMAS standards, when applicable.

Exhibit 4-1 is a list of tables that will be created at HIO Headquarters and used by the A/D/T.

Exhibit 4-1 A/D/T LOOKUP TABLES

- | | |
|---------------------------|---------------------------|
| - Governorate Table | - Marakez Table |
| - Sheyakhat Table | - Sectors Table |
| - Activities Table | - Employment Status Table |
| - Beneficiary Types Table | - Job Termination Table |
| - Facility Types Table | - Facility Table |

4.2 The Bed Master Function

This function will maintain a bed mapping system that will monitor the status of each bed in a hospital. It will identify the patient in each bed, as well as locate empty beds in the correct hospital section for newly-admitted or transferred patients.

This file must be created only when the A/D/T is first implemented in a hospital, or when a hospital room is reassigned to a different hospital section. Once the file is created, it will display:

- o bed status,
- o patient-bed assignment, and
- o available beds and bed count by section.

4.3 The Admission Function

This function will allow the admission clerk to check the eligibility of the patient and enter all the needed data to admit a patient to the hospital. It will also create the Hospital Unique Number (HUN) that will be used by the Inpatient Patient Records System.

During the admission process, a function key can be used to reference the Bed Master Function. The function will recommend a room and bed for the patient in the appropriate hospital section. The Admission/Discharge Office clerk will also be able to check for availability of an operating room through the Operation Theater Scheduling Function. This subsystem will also be available through a function key.

4.4 The Discharge Function

This function allows an Admission/Discharge Office clerk to record data related to a patient's discharge from the hospital. It will produce any necessary reports and forms needed for discharge, and will "close the circle" of data collected about a patient's stay in

the hospital.

The discharge function will record the discharge date, length of stay, discharge outcome, and discharging physician. This function also update the bed status automatically, to indicate that the discharged patient's bed is no longer occupied and is available.

For each patient, the function will record one of the following discharge outcomes:

- o The patient was cured and discharged by a physician.
- o The patient was not cured and discharged by a physician.
- o The patient died.
- o The patient is transferred to another hospital or facility.
- o The patient leaves the hospital against medical advice.

This function will produce the discharge reports needed by the Admission/Discharge Office, such as the Patient Discharge Report (for the patient to give to his assigned clinic) and the death certificate (if permitted).

4.5 The Transfer Function

As needed, a patient may be transferred from one hospital section to another. This function will record these transfers and facilitate the process, since an accurate record of patient location and bed availability is conveniently accessible. The function will allow patient transfer in one step, and will update the bed status in both the transferring and receiving hospital sections.

4.6 Produce Statistical Reports

This function will be used to produce statistical reports for hospital management. These reports will list hospital activities related to admission, discharge and transfer, and be available on request.

The reports produced by the A/D/T will include:

- o Admission/Discharge Statistical Report (by law),
- o Sections Monthly Statistical Report for Admission/Discharge,
- o Operations Statistical Report,
- o Monthly Bed Use Map by Section,

- o Hospital Daily Count Report (occupancy rate),
- o Section Daily Count Report (occupancy rate), and
- o Average Length of Stay per Hospital Section.

4.7 The Operation Theater Scheduling Function

This function will maintain a current and accurate schedule for use of hospital operating rooms. It will list when operating rooms are available, reserve a room for an assigned block of time, and identify the surgeon who will perform an operation.

The function will allow inquiry of operation theater scheduling and print schedules as requested.

Appendix A

Data Flow Diagrams

DFD-1
ADMISSION, DISCHARGE, AND TRANSFER MODULE

This process deals with every entity in the A/D/T system.

DFD-2
RECORD ADMISSION DATA

This function is used to register the admission data from the Admission Form

DFD-3
SECTION ADMISSION

This function is used to confirm the admission of the patient into the hospital section.

DFD-4
SECTION DISCHARGE

This function is used to record the discharge data of the patient.

DFD-5
TRANSFER PROCEDURE

This function is used to record the patient transfers between hospital sections.

DFD-6
PATIENT DISCHARGE PROCEDURE

This function is used to record the discharge data from the discharge form and to produce the necessary reports.

DFD-7
BED STATUS PROCEDURE

This function will manage the bed plan and bed status.

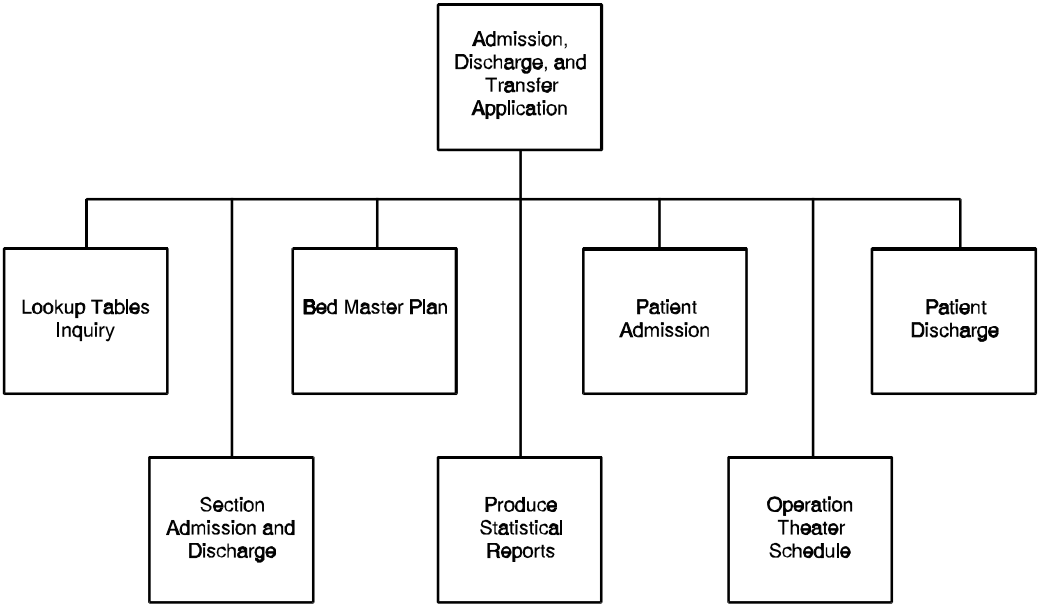
DFD-8
OPERATIONS THEATER SCHEDULE

This function will maintain the operation theater schedule.

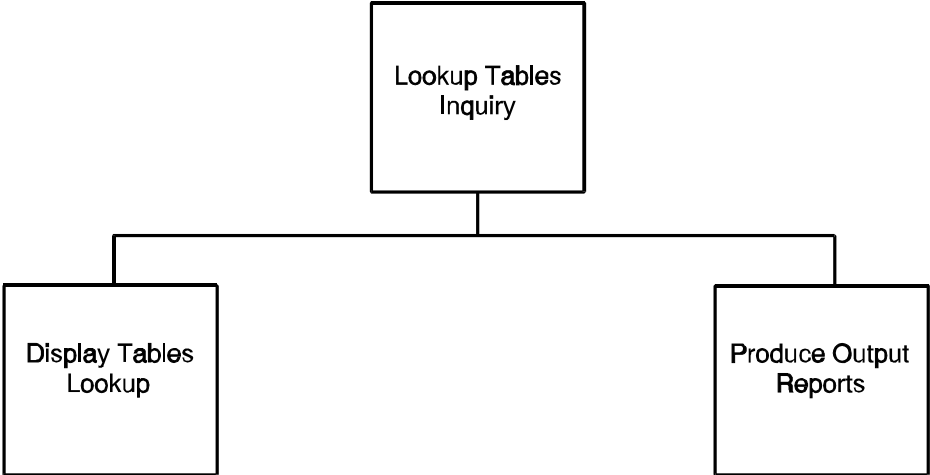
Appendix B

Functional Decompositions

FD-1
ADMISSION, DISCHARGE, AND TRANSFER FUNCTIONS



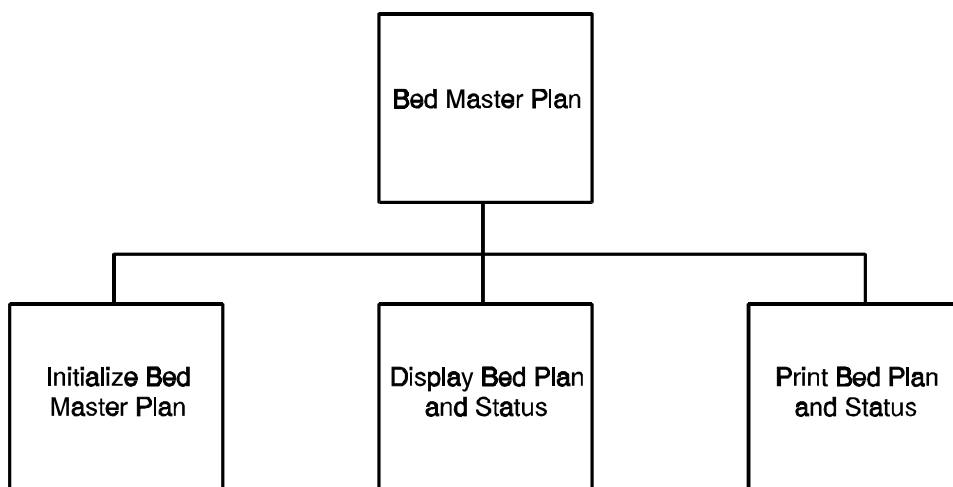
FD-2
LOOKUP TABLES INQUIRY SUBSYSTEM



The Lookup Tables Function will:

- o display all lookup tables, and
- o print all lookup tables.

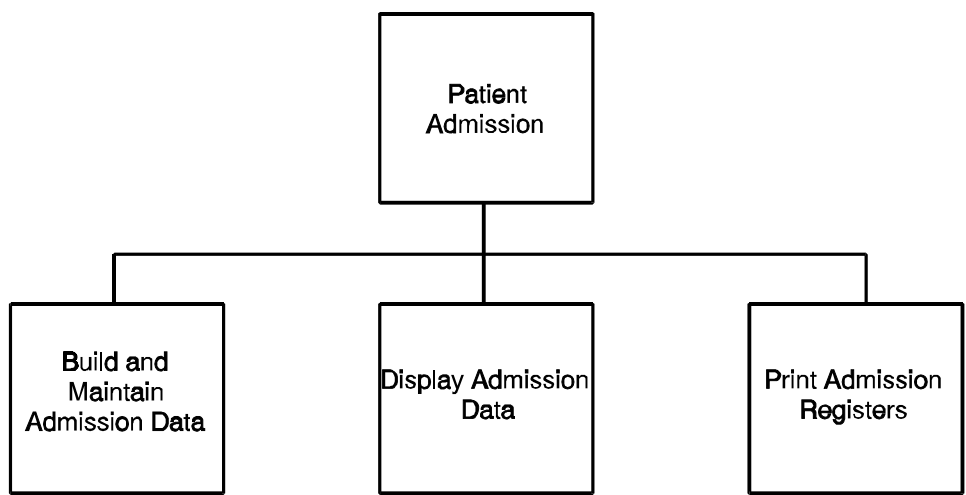
FD-3
BEDS MASTER PLAN



This function will:

- o initialize the bed master plan,
- o modify the plan if needed (new sections added, rooms redefined to another section, etc.),
- o display the bed plan and status, and
- o print the bed plan and status.

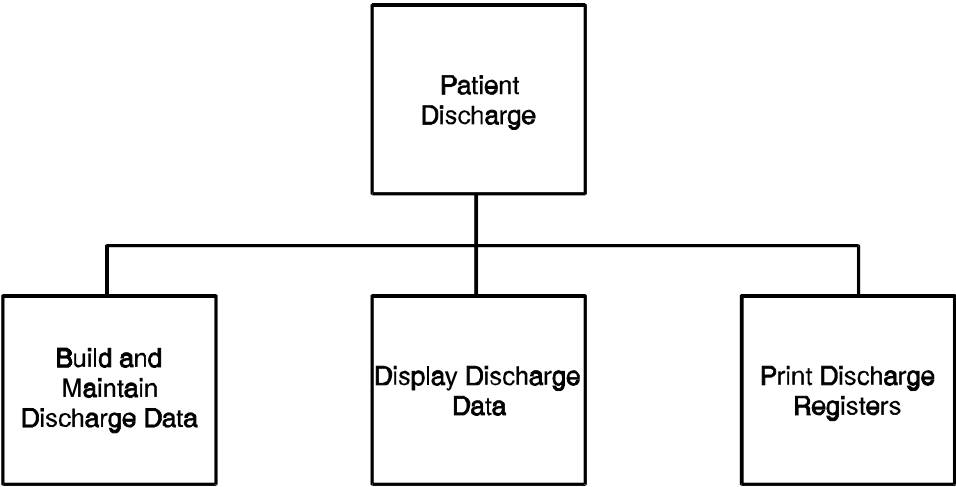
FD-4
PATIENT ADMISSION



This function will automate HIO hospital admission procedures.

- o It will build and maintain the daily admission registers. The beneficiary eligibility check will be embedded in the admission function. Through a function key, the clerk will also be able to check for and assign the patient an available bed.
- o Admission data will be available for viewing.
- o The function will print registers for the normal daily work.

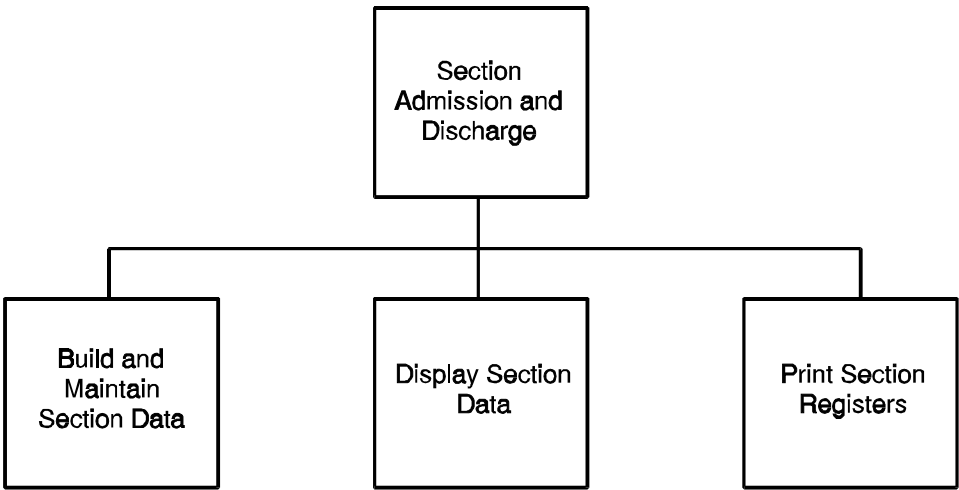
FD-5
PATIENT DISCHARGE



This function will automate the HIO hospital discharge procedure.

- o It will build and maintain the daily discharge registers, and record discharge data such as:
 - . discharge date,
 - . reason for discharge, and
 - . discharging physician.
- o It will update the bed status automatically.
- o Discharge data will be available for viewing.
- o The function will print the daily discharge registers and discharge reports.

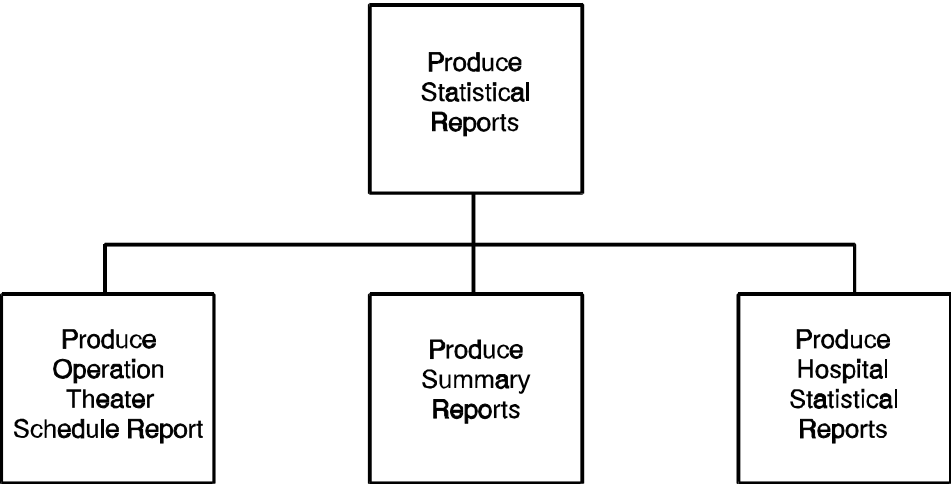
FD-6
SECTIONS ADMISSION & DISCHARGE (PATIENT TRANSFERS)



This function will record the transfer of patients from one hospital section to another.

- o It will build and maintain the daily section registers, and record patient transfers in a one-step process. It will also update bed status automatically.
- o Hospital section data will be available for viewing.
- o The function will print registers for normal daily work.

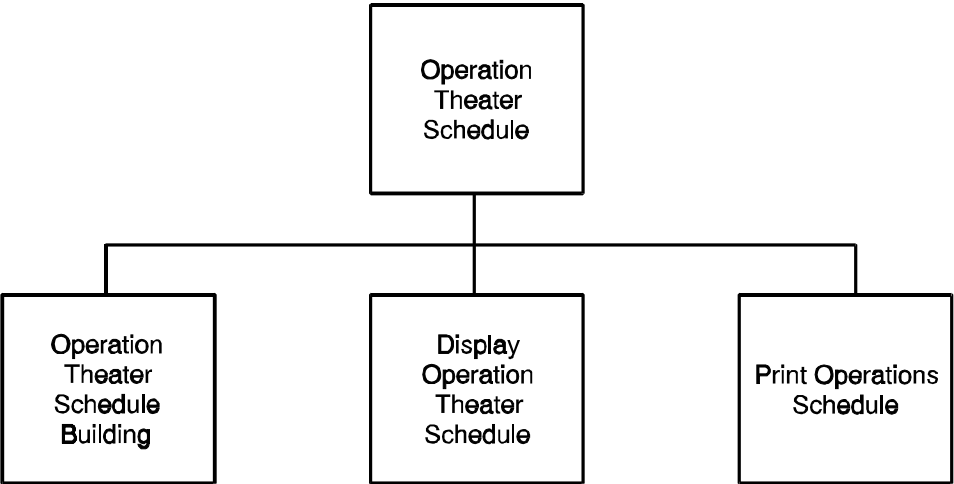
FD-7
PRODUCE STATISTICAL REPORTS



This function will produce a variety of reports on hospital activities. These reports will include:

- o operation theater schedules,
- o hospital summary reports, and
- o hospital statistical reports.

FD-8
OPERATION THEATER SCHEDULE



This function will automate scheduling of operation theaters.

- o It will build and maintain the operation theater schedule. The function will maintain information on:
 - . operation theater availability,
 - . scheduled operations,
 - . surgeons assigned for an operation, and
 - . estimated length of time needed for an operation.
- o Operation theater schedule information will be available for viewing.
- o The function will print the operation schedule.

Appendix C

Entity Relationship Diagram

ERD-1
ADMISSION, DISCHARGE, AND TRANSFER

The admission and discharge entities are separate on the ERD for purpose of simplicity, but are physically one entity.

Appendix D

References

SITE VISIT OF 24 DECEMBER, 1994

Location: Nasr City Hospital

- Subject:
- 1. Manual workflow for medical records in hospital sections.
 - 2. Admission and discharge procedures and forms used.
 - 3. ICD and CPT application in the Medical Records Department.
 - 4. Periodic reports produced by the Statistical Department.

Attendee	Title
Dr. Abdel Monem Nour El Deen	Hospital Manager
Dr. Mahmoud Borhan	Treatment Manager
Dr. Mahmoud Abdel Wahab	Medical Records Manager

SITE VISIT OF 15 JANUARY, 1995

Location: Helwan Hospital

- Subject:
- 1. Manual workflow for medical records in hospital sections.
 - 2. Admission and discharge procedures and forms used.
 - 3. ICD and CPT application in the Medical Records Department.
 - 4. Periodic reports produced by the Statistical Department.

Attendee	Title
Dr. Shawki Sehyoun	Hospital Manager
Mr. Mostafa Ibrahim	Administrative Manager

SITE VISIT OF 16 JANUARY, 1995

Location: Gamal Abdel Nasser Hospital

- Subject:
- 1. Manual workflow for medical records in hospital sections.
 - 2. Admission and discharge procedures and forms used.
 - 3. ICD and CPT application in the Medical Records Department.
 - 4. Periodic reports produced by the Statistical Department.

Attendee	Title
Dr. Mostafa Abdel Atee	Hospital Manager
Dr. Galaa El Hawary	Medical Records Manager
Mrs. Sohair Hosni	Head of Nurses

SITE VISIT OF 17 JANUARY, 1995

Location: Karmouz Hospital

- Subject:
- 1. Manual workflow for medical records in hospital sections.
 - 2. Admission and discharge procedures and forms used.
 - 3. ICD and CPT application in the Medical Records Department.
 - 4. Periodic reports produced by the Statistical Department.

Attendee	Title
Dr. Abdel Khalek Dewidar	Hospital Manager
Dr. Abdel Monem Hassan	Medical Records Manager